SOME DISTINCTIVE CRANIAL CHARACTERS OF THE CANADA LYNX.

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No one who has examined the literature relating to the lynxes can fail to be struck with the dissonance of opinions regarding the number of existing species. Gray, with characteristic insistence upon minor characters, recognizes eight species, and, going still further, divides the genus *Lyncus* into two subgenera, *Lynx* and *Cerraria*. Mivart, on the other hand, in his work upon the cat, will not even admit the genus Lynx, and writes: "The lynxes * * * cannot be separated off as a nominally distinct group or genus."* He also quotes Prof. Alphonse Milne-Edwards as saying: "Whether there are several species in the northern hemisphere, or only races, is a question which I cannot answer. There are certainly distinct forms, but before ranking them as species it would be necessary to determine what variations are due to climate, age, sex," &c.

Prof. Allen, after an elaborate study of the skulls of American carnivores, in 1876, proposes to reduce all the nominal species of American lynxes to varieties of *L. rufus*.† Regarding the Canada lynx he says: "Its supposed greater size and larger limbs are also due almost wholly to the greater fullness and length of the pelage, the fresh carcass (in a specimen from Houlton, Me.), with the skin removed, giving the same measurements as in *L. rufus* (a specimen from Colorado)."

Prof. Baird, in his "Mammals of North America," makes *L. maculatus* a variety of *L. rufus*, and recognizes three species, *L. rufus*, *fasciatus*, and *canadensis*. Professor Flower, in the ninth edition of the Encyclopædia Britannica, writes in favor of a single species for all the lynxes, American and Eurasian.

I shall not attempt in this essay to harmonize these widely variant opinions. My wish is simply to call attention to the apparent value of certain cranial characters which are of aid in distinguishing some specimens of American lynxes from others. I believe that the same distinctions obtain for the Eurasian lynxes, but the material at command is too limited to be of much service.

"The specific distinctness of *L. canadensis*, the most northern type," writes Professor Allen,‡ "has been hitherto scarcely questioned, in consequence of its supposed larger size, larger limbs, longer, softer pelage, longer ear-tufts, more indistinct markings, and generally lighter or grayer color. The longer ear-tufts correlate with the longer, softer pelage that always characterizes the boreal representatives having a wide latitudinal range. The difference in coloration is not greater than, or even so great as, that which obtains between *fasciatus* and *rufus*, or between *fasciatus* and *maculatus*, which forms naturalists now seem disposed to refer to one and the same species under the name of *L. rufus*."

* Mivart, "The Cat," p. 424. † Bull. Geol. Surv., II, 1876, 324. ‡ l. c.

Viewed from Professor Allen's standpoint these remarks have very great weight, and I have hitherto been inclined to accept his decision as final. During my examination of Mr. E. W. Nelson's Alaska collection, however, I was very much struck by the uniformity of relation of parts presented by the skulls of the Canada lynx which he collected. In all of his skulls, and, as I afterwards ascertained, in all of the skulls from British America and the northern parts of the United States, in the National collection, the portion of the presphenoid visible upon the under surface of the skull is flask-shaped, the convexity being forward. Again, in all these skulls the anterior condyloid foramen is large, and looks downward, and is *not* confluent with the *foramen lacerum posterius*. Comparing these skulls, which had been labeled *L. canadensis*, with those marked *L. rufus*, *fasciatus*, and *maculatus*, I find that in the latter the visible portion of the presphenoid is triangular or linear in outline, and that the anterior condyloid foramen is confluent with the *foramen lacerum posterius*.

These characters are of minor importance, but their constancy makes them valuable for the division of the genus. The shape of the exposed portion of the presphenoid can scarcely have any physiological significance, but the slight change in the position of the anterior condyloid foramen may to some extent influence the direction of the hypoglossal nerve. Further than this, these characters probably have no special significance. They are simply differences in detail of structure, which, having been established, are perpetuated from generation to generation.

On account of their presence and constancy, however, I cannot, with Professor Allen, regard the greater size and the differences of pelage observable in the Canada lynx as due entirely to climatic conditions. In fact, in such skins of the Canada lynx as I have examined I find no transition to *L. rufus*, such as binds the latter species with the so-called *L. maculatus* and *L. fasciatus*.

I do not regard the paleness of the fur in *L. canadensis* as a sign of obsolescence of marking, but as the normal style of coloration of a species not highly colored. So far as the denseness of the pelage is concerned, I am willing to believe that it is due entirely to climatic influences. The color of the tail, however, I believe to be characteristic of the species.

Of twenty-four skulls having the characteristics of *L. canadensis* in the National collection, eighteen are from Alaska, two from the Red River of the North, and one from each of the following localities: The main fork of Medicine Bow Creek, Liard River, Fort Simpson, and Nebraska. The sex of only four specimens is recorded; two of these are males and two females. Forty-six other skulls, labeled *L. rufus*, *maculatus*, and *fasciatus*, agree as regards the position of the anterior condyloid foramen and the shape of the presphenoid.

It is interesting to observe that two skulls from Sweden, labeled respectively *Felis lynx* and *Lynx cervaria*, agree with *L. canadensis* in the characters in question. I can only regret that I have no skulls of the other nominal species of Eurasian lynxes at command for examination.